



UTAH OFFICE OF  
**ENERGY DEVELOPMENT**

# Transmission Infrastructure Office of Energy Development

Matt Anderson, *Acting Director*

# Transmission



*As new electricity generation resources are developed and demand increases, our grid must expand and adapt*





## Utah and Bordering States Operating Plants

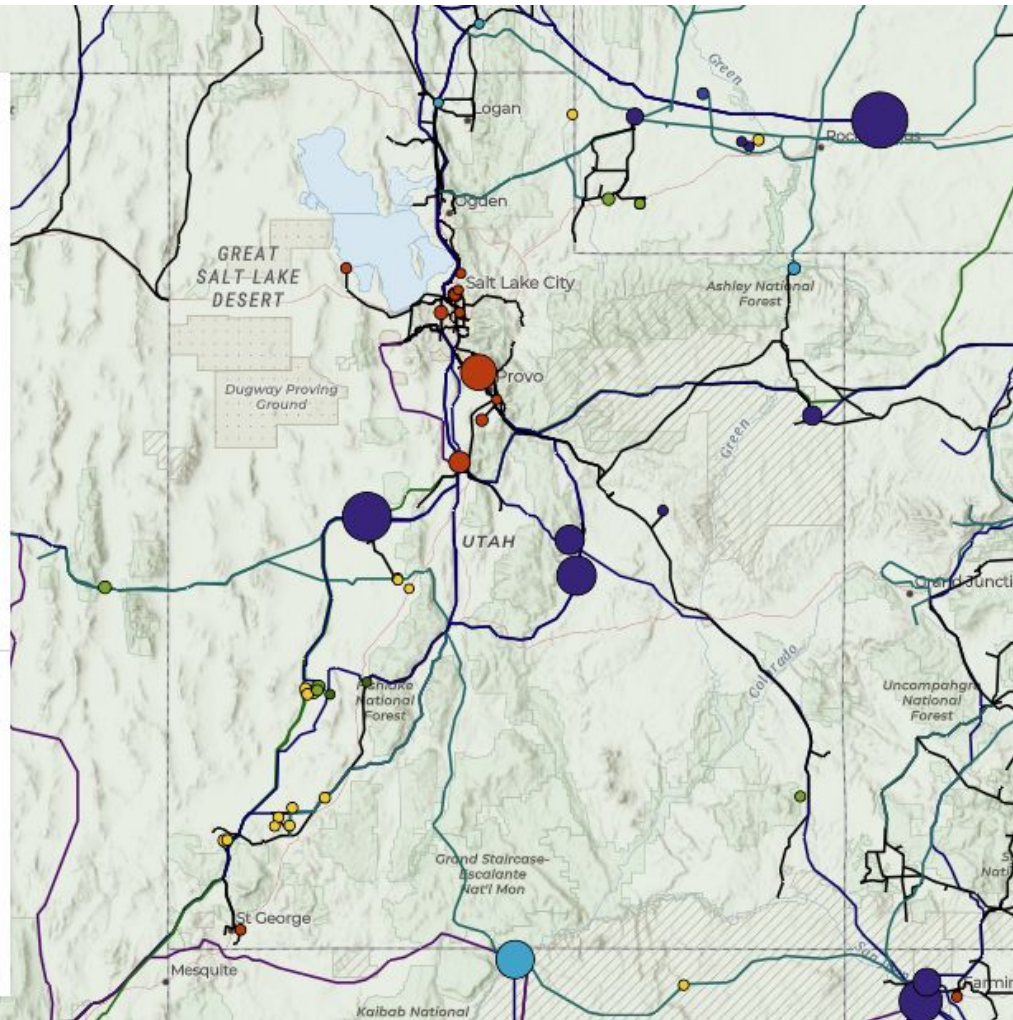
### Fuel Type

- Biomass
- Coal
- Gas
- Geothermal
- Nuclear
- Oil
- Other Nonrenewable
- Solar
- Water
- Wind
- others

## WECC Transmission System

### Voltage (kV)

- 100-161 kV
- 230 kV
- 345 kV
- 500 kV
- DC Line





## PacifiCorp Active and LGIA Queue

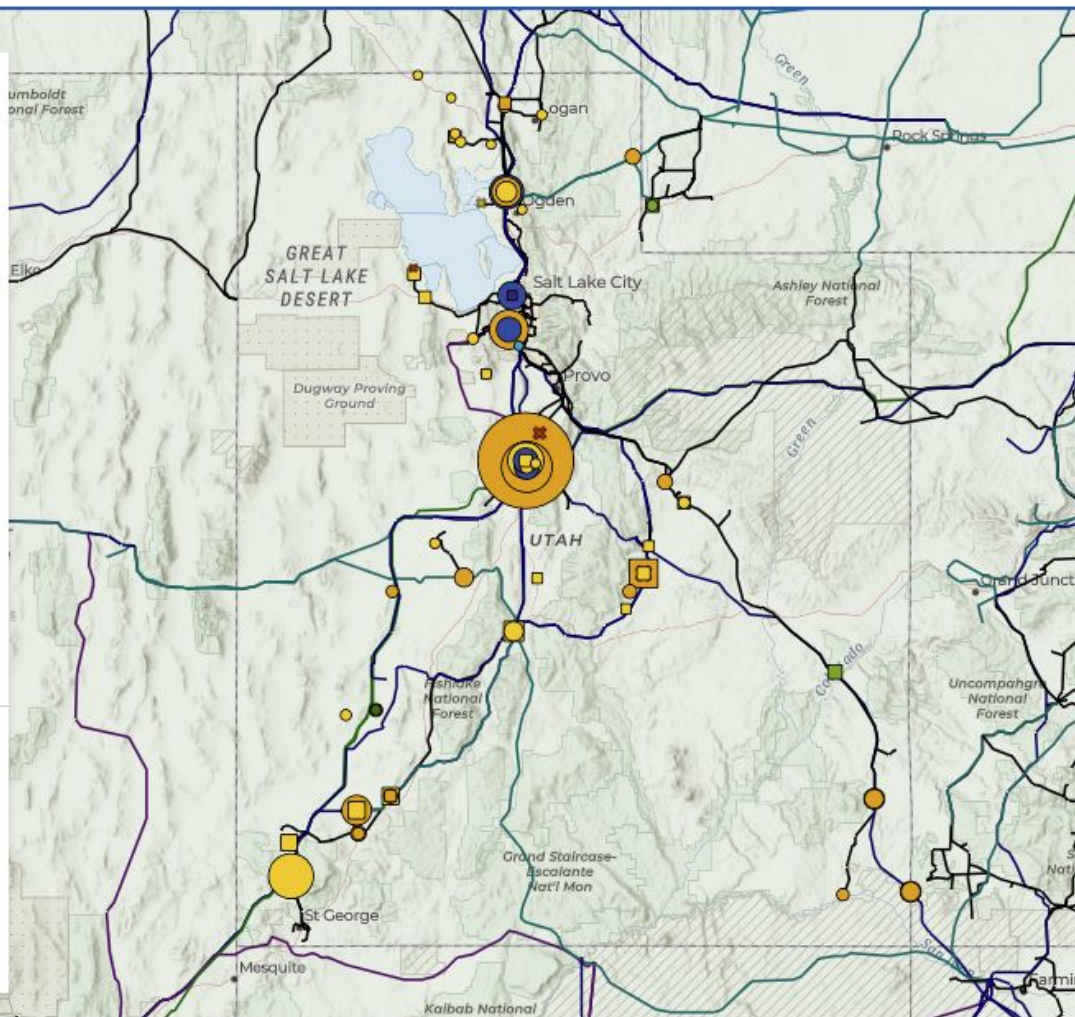
Status: Fuel Type

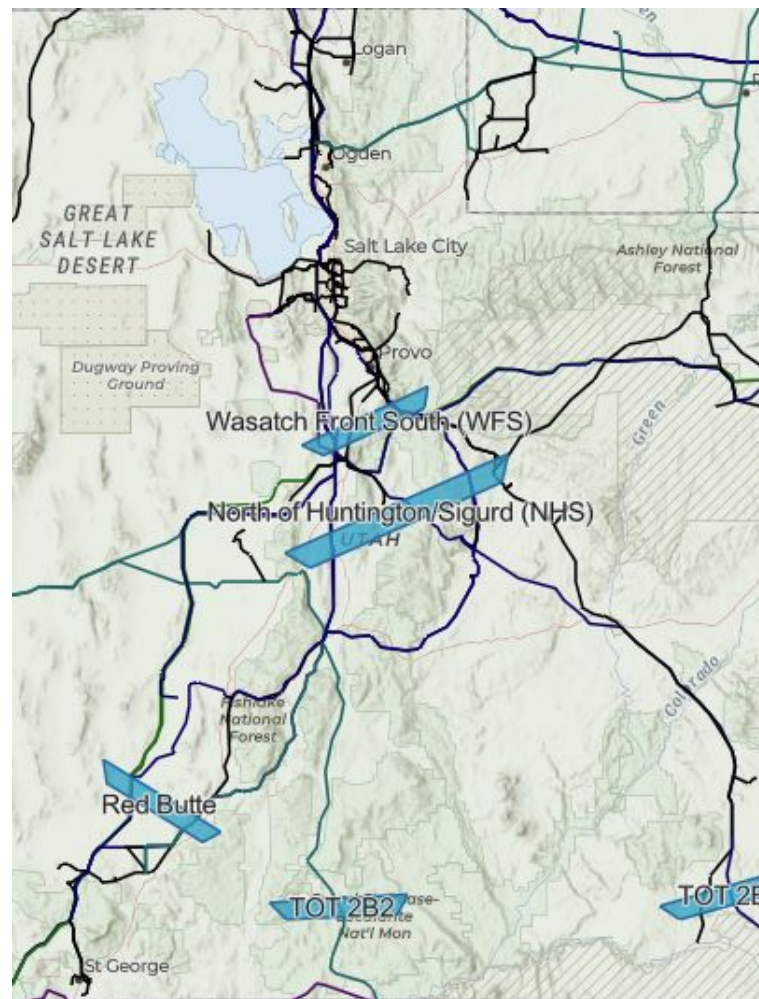
- Active: Battery
- Active: Geothermal
- Active: Solar
- Active: Solar & Battery Storage
- Active: Wind
- Active: Wind & Battery Storage
- LGIA In Progress: Solar
- LGIA In Progress: Solar & Battery Storage
- LGIA In Progress: Waste Heat
- LGIA In Progress: Wind
- LGIA Suspended: Natural Gas
- LGIA Suspended: Solar
- LGIA Suspended: Solar & Battery Storage

## WECC Transmission System

Voltage (kV)

- 100-161 kV
- 230 kV
- 345 kV
- 500 kV





# Questions?



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# Regional Transmission Organizations

## Office of Energy Development

Matt Anderson, *Acting Director*

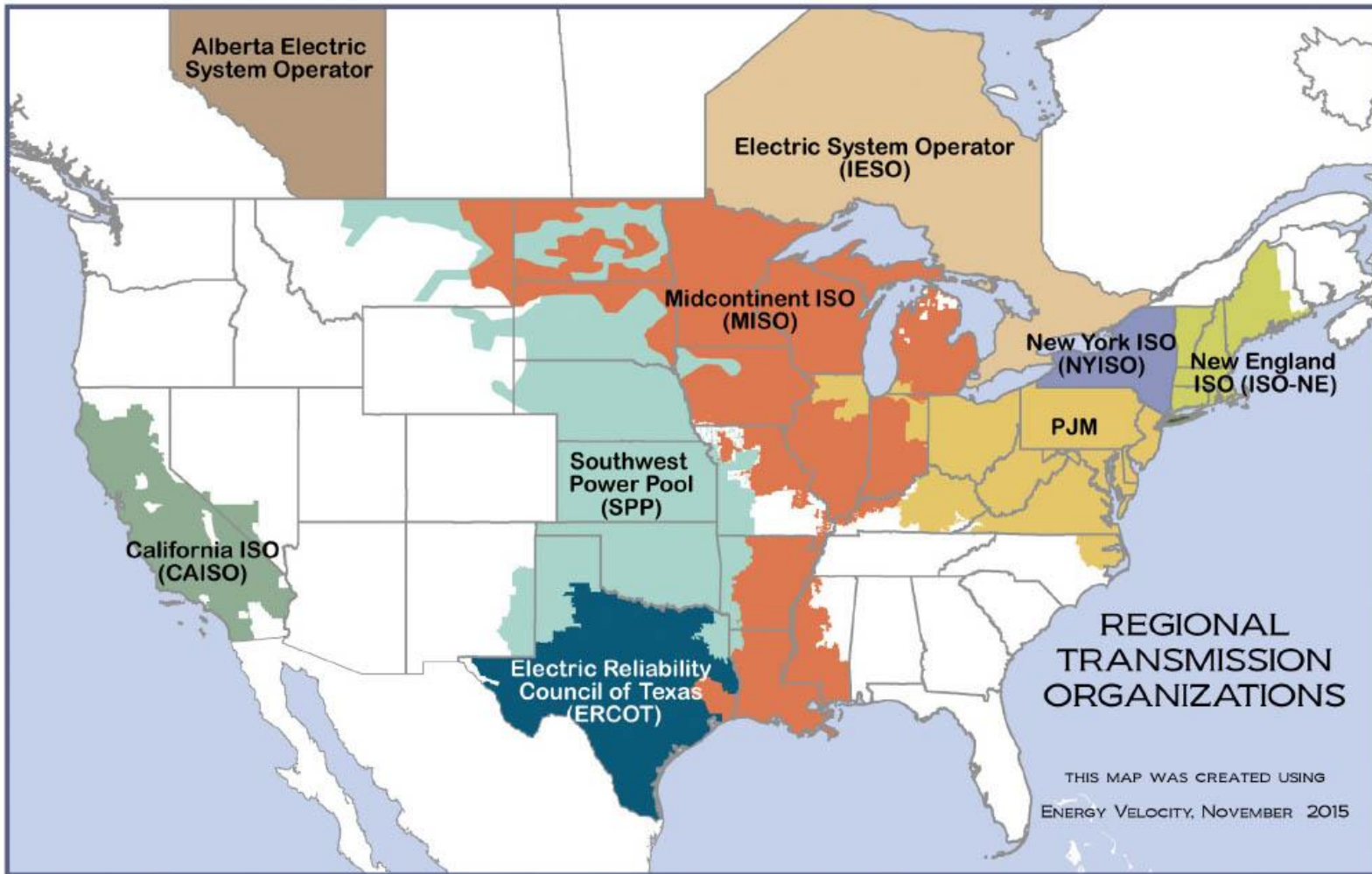


# RTOs



*Combine the transmission facilities of several transmission owners into a single transmission ecosystem*





# RTO: What they do



- Manage power flows on high voltage systems across multiple utility service areas
- Dispatch electricity generating units within the region to meet demand
- Serve as the platform for wholesale energy market transactions
- Manage long-term planning as it relates to anticipating energy demand and conditions



# RTO: Goals



- Improve Reliability
- Economically Dispatch Resources
- Stabilize Variability in Renewable Energies
- Reduce the Need for Reserves
























# Western States Market Study



































*Wider market structures, like what an RTO can accomplish, more efficiently dispatch resources. Because of this, it's possible the west could see some savings. However, the major trade off is ceding oversight of utilities to the federal government, giving up state control.*











































Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Efficient grid operation which allows low (and zero) marginal cost resources to be dispatched and reduces overall costs of integrating clean energy technologies	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Lower barriers to access new generation in high-quality renewable resource locations	 <u>Poor</u>	 <u>Poor</u>	 <u>Good</u>	 <u>Excellent</u>
Opportunities for clean electricity resources to be added to the grid (e.g. direct customer access to renewable/clean resource power purchase agreements)	 <u>Good</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Provides financing opportunities and a variety revenue stream opportunities for clean electricity technologies	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Economically facilitates emissions reduction goals/requirements via market signals	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Transparent and timely information on pricing, resource operations, and emissions	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>



Ability of Market Construct to Support <u>Reliable, Affordable Provision of Energy to Consumers</u>	Bilateral	Real-Time	Day-Ahead	RTO
Efficient grid operation which reduces costs and increases flexibility of transactions	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Ability to unlock full potential of existing generation (lowering costs) and to decrease generation capital costs/investments	 <u>Poor</u>	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>
Ability to unlock full potential of existing transmission system (lowering costs) and to decrease transmission capital costs/investments	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
General ability to support reliable operations	 <u>Good</u>	 <u>Very Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Visibility into electric system conditions to improve reliability	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Transparent and timely information available to state PUCs, consumer advocates and other stakeholders	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>
Long-term mechanisms to support a system with adequate electric resources	 <u>Fair</u>	 <u>Good</u>	 <u>Good</u>	 <u>Very Good</u>
Increased opportunities for cost-effective demand-side resource participation	 <u>Fair</u>	 <u>Good</u>	 <u>Very Good</u>	 <u>Excellent</u>



Ability of Market Construct to Retain State Regulatory Authority on Key Jurisdictional Elements	Bilateral	Real-Time	Day-Ahead	RTO
Ability for state to retain authority over resource adequacy	 <u>Good –</u>  <u>Excellent</u>	 <u>Good –</u>  <u>Excellent</u>	 <u>Good –</u>  <u>Very Good</u>	 <u>Poor –</u>  <u>Good</u>
	As it exists today, the interconnected nature of the Western grid, including complexities around regulation of multi-state utilities, may limit the practical impact of state authority over resource adequacy. Market development, up to and including an RTO, can provide similar levels of “good” state authority, provided the market design includes best practices for informed engagement and authority of a Regional State Committee over resource adequacy matters. One individual state’s ability to affect overall change on resource adequacy will depend on the market’s governance, design and make-up.			
Ability for state to retain authority over the resource mix of utilities it regulates	 <u>Good –</u>  <u>Excellent</u>	 <u>Good –</u>  <u>Excellent</u>	 <u>Good –</u>  <u>Excellent</u>	 <u>Fair –</u>  <u>Very Good</u>
	As it exists today, the interconnected nature of the Western grid, including complexities around regulation of multi-state utilities and generation units with multiple owners, may serve as limitations on the practical authority states have over the resource mix of regulated utilities. Market development, up to and including an RTO, can provide similar levels of state authority over the resource mix, though market prices and market rules may impact resource mix decisions. The addition of market elements that are more likely to affect resource mix decisions (such as inclusion of a capacity market) can serve to reduce state’s practical authority over the resource mix. States can improve their market experience by participating in market design and discouraging market elements that would serve to impact state’s practical authority over the resource mix.			
Ability for state to retain authority over transmission planning and prudence/cost recovery for transmission investments	 <u>Good –</u>  <u>Very Good</u>	 <u>Good –</u>  <u>Very Good</u>	 <u>Good –</u>  <u>Very Good</u>	 <u>Fair –</u>  <u>Good</u>
	As it exists today, states have various roles in transmission planning (with FERC-jurisdictional utilities adhering to FERC transmission planning Orders such as Order 890 and 1000), but states generally retaining siting authority for transmission. FERC has jurisdiction over rates and services for electric transmission in interstate commerce, but most states continue to determine how transmission costs are (or are not) passed on into retail electric rates. Market development, up to and including an RTO, can provide similar levels of “good” state authority over transmission planning and cost allocation, provided the market includes best practices for informed engagement and authority of a Regional State Committee over transmission-related matters.			
Ability for state to retain authority over retail electric rates	 <u>Good –</u>  <u>Excellent</u>	 <u>Good –</u>  <u>Very Good</u>	 <u>Good –</u>  <u>Very Good</u>	 <u>Fair –</u>  <u>Good</u>
	The interconnected nature of the Western grid, including complexities around regulation of multi-state utilities, may serve as limitations on the practical authority a state has over retail electric rates, even when they have full legal authority over these matters. Market development should not change the legal authority of states over retail electric rates. Though as more inputs into the ratemaking process come from a market, a state’s ability to challenge costs may be diminished in practice. Market constructs, up to an RTO, can provide strong state authority on retail electric rates. States can improve their market experience through strong engagement in the market processes and through careful consideration of any proposals to unbundle retail rates.			
Ability for states to be involved in the process of obtaining approval to participate in the market construct	 <u>Fair</u>	 <u>Good –</u>  <u>Very Good</u>	 <u>Good –</u>  <u>Very Good</u>	 <u>Excellent</u>
	State approval of market participation is almost certainly required for an RTO, while varying degrees of state approval may be necessary for other market constructs. States can utilize the approval process to place conditions on a decision to enter a market, which can help improve state retention of jurisdiction in the other metrics within this scorecard.			





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